

# **Implementation Plan for Framework to Provide a Consistent NWS Hydrology Web Presence**

## **I. Overview**

The vision specified in “Framework to Provide a Consistent NWS Hydrology Web Presence” (see Appendix A) is to provide a nationally consistent, easy to navigate and readily understood source of NWS hydrologic information on the Internet that is supported nationally. Success will require collaboration across the entire Hydrologic Services Program (HSP), and needs to include NWS resources beyond the HSP, most notably, NWS Web infrastructure and operational systems (i.e., AWIPS). The evolution of the NWS hydrologic Web presence will be driven by our commitment to meet user requirements.

This document provides details on how we can accomplish these goals.

The broad outline of the process starts with collection of user requirements – what services do users need/want. We can expect these requirements will be diverse, covering all aspects of our current services as well as identifying new services. Some needs will be easy to meet while others may well be beyond any reasonable expectations, given anticipated resources. As a result, there is a need to prioritize requirements.

Functional requirements then need to be translated into implementation plans – translating the “what” into the “how.” The details of the implementation plans will lead to an estimate of the resources needed to meet the requirements. While AHPS funding will provide some of the needed resources, “non-AHPS” resources will also be necessary. Field offices will have an opportunity to help with Web implementation. There may be times when content for the Web pages does not exist. In these cases, there will be a need to use the formal NWS (OSIP) and/or hydrologic (HOSIP) requirements processes to make the needed changes to operations that will lead to new products and services to meet user requirements.

Funding for implementing enhancements to the AHPS Web pages will come from the AHPS budget. This imposes a level of uncertainty. Each year the budget is subject to adjustment, based on exigencies of the political process at OMB, in Congress, and at both NOAA and the NWS. The process described below should be viable as long as we have minimal resources. Funding will limit the rate at which we deploy enhanced services.

## **II. Requirements Gathering**

Evolution of not only the AHPS Web pages but all services provided by the HSP will be driven primarily by user requirements. For the purpose of evolving the AHPS Web presence, this goal will be achieved by collecting user feedback directly on the Web (see Appendix B), and from NWS staff input, based on their interaction with users (see Appendix C).

As indicated in the framework document (Appendix A), feedback from users about national HSP Web pages will be centrally collected using an OMB-approved survey/feedback Web page supported by the OCIO. Feedback links in each Region will point to a Web page specific to that Region. This will allow routing of feedback to each Region. The information provided will be posted to a data base. NWS customers and partners as well as NWS staff will be able to use a Web interface to access and review information in the data base for each Region. Initially, there will be no single Web page providing an integrated national summary of user feedback. However, all users will have access to feedback provided in each Region.

Collection of suggestions and requirements from NWS staff will also use a Web-based paradigm, similar to the general feedback model indicated above. However, since input will be provided only by government employees, the Privacy Act limitations on the information collected does not apply. Therefore, the internal requirements Web page will contain more specific questions as well as opportunity for free-form input. This information will be posted to a data base that will be separate from the data base containing public input/feedback. OCWWS will support the internal feedback/requirements page and associated data base. Access to the internal feedback page as well as to the data base containing the input will be restricted by requiring the use of a NOAA e-mail ID and password.

All requirements considered as part of this framework will be collected and documented in one of the two data bases described above. This will assure the prioritization process will be totally open and transparent.

### **III. Resources**

As indicated, there is a degree of uncertainty with regard to AHPS resources. However, we will assume that two contract FTEs will be available. In addition, the plan assumes AHPS funding will support up to two meetings a year to coordinate implementation details. These meetings will facilitate coordination between OHD and the Regions in areas such as deployment of AHPS Web pages at Regional Web farms, identifying contributions of field staff in helping accomplish the goals of a given phase, and coordinating any operational issues/changes needed to support Web content. Coordination with both Regional Web masters and the OCIO is necessary to ensure the needed infrastructure is available. There is a wealth of enthusiasm and talent in NWS field offices. In a number of cases, staffs at these offices are highly motivated to help improve the NWS. Coordination with Regional and local managers is necessary to tap in to this pool of talent in a way that does not impede operations. Experience with national implementation of the AHPS Web presence, so far, has clearly demonstrated the need for close coordination and cooperation with the Regions to help manage implementation details.

AHPS resources will be allocated to (1) development and implementation of new Web features, (2) enhancements to existing Web features, and (3) fixing bugs and implementing mandatory changes (e.g., required by security considerations). Because funding may vary, planning will assume 60% of available contractor support will be devoted to new development. The remaining 40% will be used to fix bugs and deal with mandatory requirements, with whatever time left over devoted to enhancing existing Web pages. Clearly, if funding is severely limited, funding will be first allocated to maintenance (3).

In some cases, meeting user requirements will require changes in operations that lead to new products or the way information is provided. In other cases, requirements will require infrastructure that is not currently available. In both cases, the HSP will need to work within established procedures to provide requirements that will result in the NWS making the needed investments to allow documented user needs to be met. Clearly, these resources are beyond AHPS, and, in some number of cases, will be beyond the ability of the HSP to meet. Meeting these requirements will require a persuasive statement of user needs, combined with a concerted lobbying effort at all levels of the organization: specially, we need to enlist the support of our NWS Directors so they feel compelled to advocate investing the necessary resources.

## **IV. General Schedule**

Because both funding levels and requirements cannot be predicted, implementation will occur in fixed 6-month phases, something like AHPS OB scheduling. The amount of work accomplished in each phase will be a function of contractor funding and the level of field support. What follows describes a ‘generic’ 12-month cycle that includes requirements gathering and translation into a work plan (first 6 months) and a 6-month implementation period. Each phase will reflect documented requirements, prioritized to reflect available resources.

### **• Formulation of Functional Requirements Statement**

OCWWS/HSD will be responsible for reviewing both the user feedback (Appendix B) and internal requirements (Appendix C) data bases to identify user needs. This information will be categorized as (1) possible to do within the next phase, (2) needs to be deferred to a future phase, or (3) requirements that are beyond the scope of the AHPS Web effort. Examples of the latter, include (1) making the output of ESP-ADP more flexible so it can be posted to a data base to support alternate portrayal of probability information on the Web, (2) developing a national precipitation mosaic similar to what is provided by Southern Region RFCs, and (3) new capabilities, like inundation mapping along rivers. To meet these requirements OCWWS will work with the Regions and OHD to provide input into either the OSIP or HOSIP processes. Once these requirements are met operationally, the resulting information can be incorporated into the HSP Web presence (if appropriate).

Those requirements that can be met within the scope of the AHPS Web enhancement effort will be prioritized, with those that are easiest to meet, that provide the greatest benefit and/or that are most urgent, given highest priority (i.e., start with ‘low-hanging fruit’). OCWWS/HSD will work with OHD to develop a list of tasks that can be reasonably accomplished in a 6-month period. This list will be provided to the Regions for review and comment.

To maintain momentum, the review process will be similar to that used for NWS policy documents. Regions will have three weeks to provide comments on the draft functional requirements statement. OCWWS/HSD will review the comments and create a final statement of requirements in consultation with OHD. OCWWS/HSD will prepare a “disposition of comments” document that will provide the Regions with the rationale for the prioritization used to develop the requirements statement provided to OHD.

- **Implementation Plan**

Using the statement of requirements provided by OCWWS/HSD, OHD will develop an implementation plan for the upcoming 6-month development and implementation phase. As part of this process, OHD may initiate a meeting with staff from the Regions to identify issues and to determine what field support may be available to supplement the contractor.

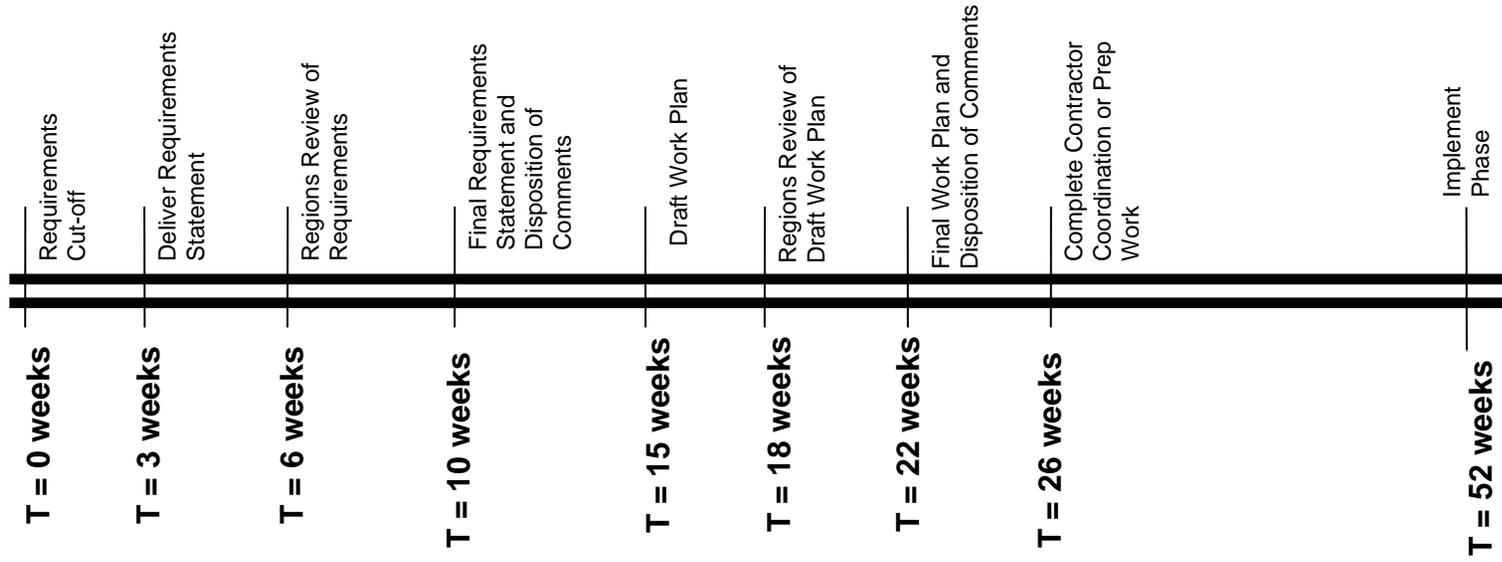
As with the statement of requirements, the Regions will be provided with the proposed implementation plan for review and comment. OHD will provide the Regions with the final implementation plan and a “disposition of comments.”

- **Development and Implementation**

As laid out above, implementation will be accomplished primarily by contractor support. However, field office staffs have been instrumental in delivering the current AHPS Web presence, and their continued contribution will be encouraged. As indicated below (Section VI), a broad system architecture will be defined to provide a frame of reference for future development. All contributions made by field staff will be accomplished within this framework. This will establish a coordinated approach among various contributors and assure effective integration by the contractor.

- **Schedule**

Figure 1 shows a Gantt chart of a ‘generic’ schedule for a full phase – 12 months. The first 6 months include requirements gathering, analysis and prioritization, preparation of functional requirements and negotiation of a work plan for the development and implementation portion of the phase (last 6 months). At the time development and implementation is started, the next 6-month requirements gathering and work plan portion of the next phase will begin. This will overlap with contractor/field development and implementation work. The relationship of successive phases is shown in Figure 2.



**Figure 1.** Schematic showing chronology of a standard AHPS Web implementation phase.

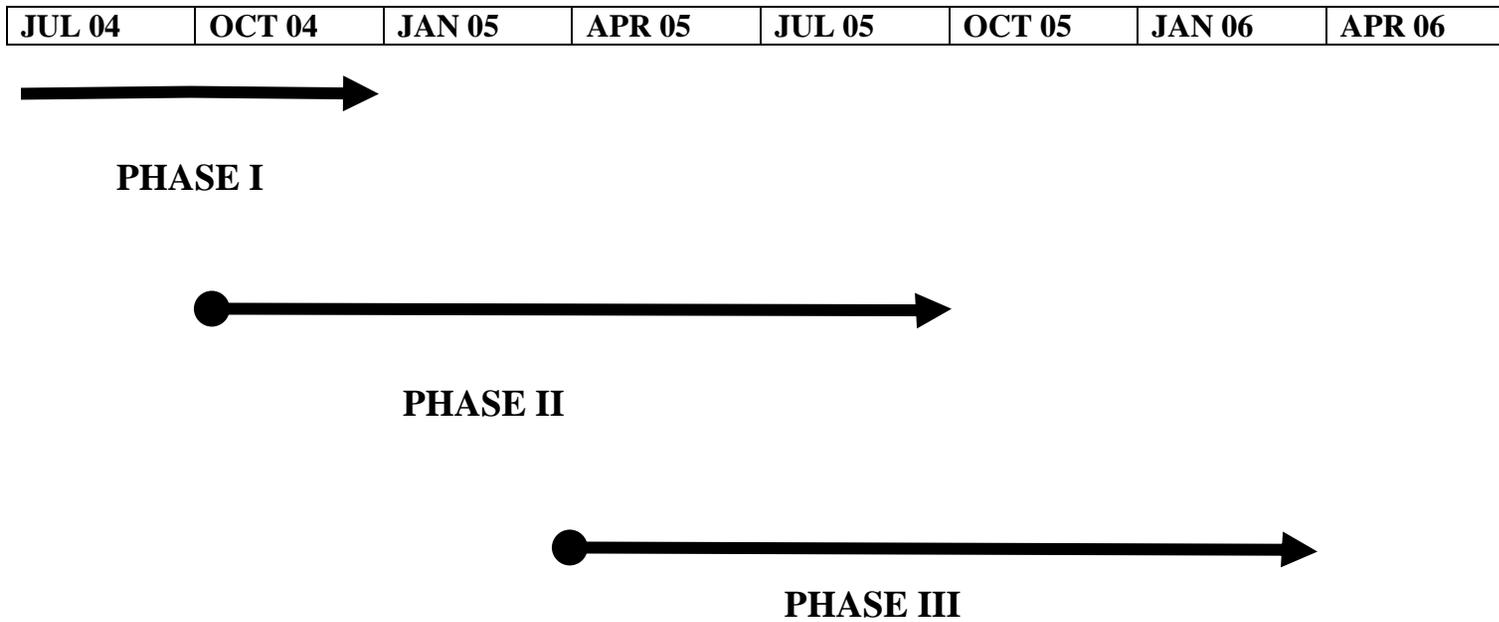
Specific explanation of Figure 1:

Requirements statement/Statement of work (6 months)

- The cut off for requirements collection will be October 1 or April 1 (T=0 weeks)
- Three weeks later, OCWWS/HSD will provide the Regions with a prioritized list of tasks for the next phase (T=3 weeks)
- The Regions will have 3 weeks to provide comments (T=6 weeks)
- OCWWS/HSD will have 4 weeks to coordinate with OHD (ensure scope of work is reasonable, given available resources) to create a final statement of requirements and to prepare a disposition of comments that will be provided to the Regions (T=10 weeks)
- Using the final statement of requirements, OHD will have 5 weeks to prepare a draft work plan for review by the Regions (T=15 weeks)
- The Regions will have 3 weeks to provide comments (T=18 weeks)
- OHD will have 4 weeks to develop a final work plan. As part of this process, OHD may choose to have a meeting with representatives from the Regions and including the contractor (T=22 weeks)
- Four weeks are allocated for OHD and the contractor to coordinate and prepare for the development and implementation portion of the phase (T=26 weeks)

Development and implementation (6 months)

- Development and implementation (T=52 weeks)



**Figure 2.** *Time sequence of first three AHPS Web implementation phases.*

## **V. Maintenance and Enhancements**

Because the AHPS Web presence is so visible, and, for a significant number of our users it is the primary mode of obtaining NWS hydrologic information, it is imperative that the Web infrastructure be sound and reliable. The contractor will be the primary source of support for the AHPS Web pages (i.e., software), but will rely on the NWS for support of systems and communications.

During each phase, a portion of the contractor funding will be allocated to maintenance and enhancements of existing Web pages. To ensure evolution of the AHPS Web presence continues to move forward, unless there is a drastic reduction in the support level, some portion of the contractor's time will also be allocated to new development. Assuming 2 FTEs, the initial allocation will be 0.8 FTE (40%) for maintenance and enhancement, and 1.2 FTE (60%) for new development.

The mix allocated to each category can change from phase-to-phase, based on an assessment of past maintenance requirements and the prioritization of enhancements compared to new development. Of the 0.8 FTE for maintenance and enhancements, maintenance (i.e., bug fixes) will always be given priority.

Enhancements will generally fall within two categories: (1) those suggested by users, and (2) changes that will result in more efficient use of the Web infrastructure.

## VI. Phase I

During the transition from the AHPS IWT to the new “framework,” the general time line above will need to be modified. We need time to spin-up the requirements gathering and prioritization process that will lead to the specification of a work plan for the subsequent phase. Phase I will extend to March 31, 2005, and is based on tasks already specified or discussed by the IWT. Requirements analysis and development of a work plan for Phase II will begin on October 1, 2004.

Current activities, initiated by the IWT, which will be completed in Phase I include:

- Update rivdat with new file transfer protocol (rsynch) to comply with AWIPS security requirements [Aug. 4]
- Establish a configuration management data base and provide a Web-based interface to the data base that will allow WFOs/RFCs to control the content of ‘their’ Web pages [Sept. 1]
- Refinements and enhancements to the hydrograph generation software to make it more efficient and provide additional capabilities (e.g., flow-only hydrographs) [Dec. 30]

Based on challenges in scaling the software infrastructure developed by the Central Region in their initial groundbreaking effort at delivering vastly improved AHPS Web services, the IWT recognized the need to develop a more robust systems architecture that would be easier to maintain and scale to accommodate increasingly more demanding requirements. As part of Phase I, the contractor will work with the OCIO, Regional Web masters, OHD, representatives from the Regional managers of the HSP, and other appropriate stakeholders, develop a description of an end-state system architecture that will address the following design features (but not necessarily limited to the following list):

- data base technology
- data flow, including source and destination systems
- communications requirements, including bandwidth
- communications protocols
- security considerations
- server load balancing
- robust, 7x24 reliability
- software development environment (e.g., PHP, Java, etc.)
- software architecture, including standard interfaces among system components
- configuration management

The overall system design needs to account for trade offs between resource limitations, reliability requirements, high load levels and existing and planned NWS Web infrastructure

The resulting systems architecture document will provide an overall blueprint for the evolution of the AHPS Web presence. It will assure an effective and coherent pathway for development that offers the potential to expedite delivery of AHPS services. The document will also provide a clear development framework to ensure contributions from field office staff can be smoothly integrated into the baseline software provided by the contractor. In addition, this architecture will define a framework that can be used by the Regions, RFCs and/or WFOs to provide services not included in the AHPS baseline.

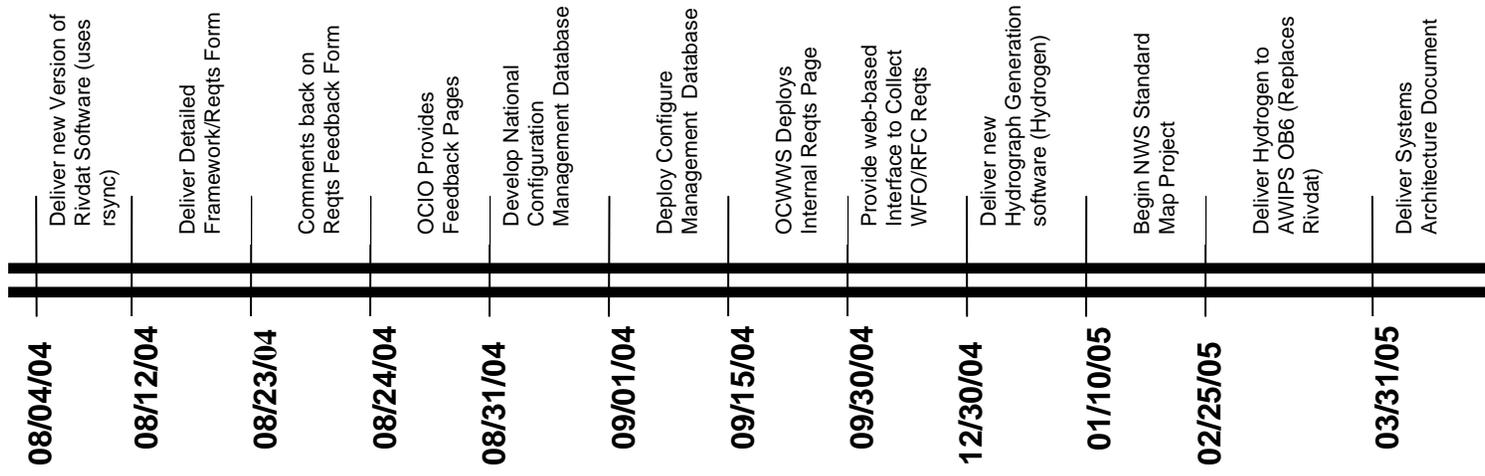
Finally, analysis of the systems architecture will allow the HSP to understand the long-term systems requirements. It is likely that they will require support (i.e., Web infrastructure) beyond what are feasible using only AHPS resources. The systems architecture will be used to develop requirements statements to meet these needs. These requirements statements will be submitted as part of the OSIP/HOSIP process and will also be used in the PPBES process.

Prior to the start of Phase II (October 1, 2004), we need to implement the national user feedback capability as well as provide the Web interface for staff to submit requirements.

The OCIO will set up feedback pages (one per Region, except that AR and PR will share a single page) by August 24. The contractor will work with the Regions to include the appropriate URL in all feedback links on AHPS Web pages in their Regions. The target for completion in all Regions is September 1. The Regions need to migrate feedback received in the past to the national feedback data base. This information can either be manually input using the feedback interface provided by the OCIO, or Regions can provide the information 'in bulk.' To facilitate this, the Regions will be provided with the schema for the OCIO feedback data base by August 24, to allow them to format this information in a comma-delimited ASCII file. This will allow Regions time to provide their input in a single file. Manually input information is due by September 30. To allow time to import bulk information into the data base, Regions who provide information in this format, the files need to be provided by September 24.

The draft layout of a form that will be used to gather requirements from NWS staff is provided in Appendix C. Comments and suggestions from the Regions on this draft are due August 23. The form should be available on the Web by September 15. This will only allow two weeks for input before the start of Phase II.

The time line for Phase I is shown in Figure 3. As indicated above, this is a transition phase and does not conform to the description in Section IV. The formal requirements analysis and development of a statement of work did not occur – it was, in effect, replaced by activities of the IWT. The development and implementation portion is ongoing, and will finish in March 2005.

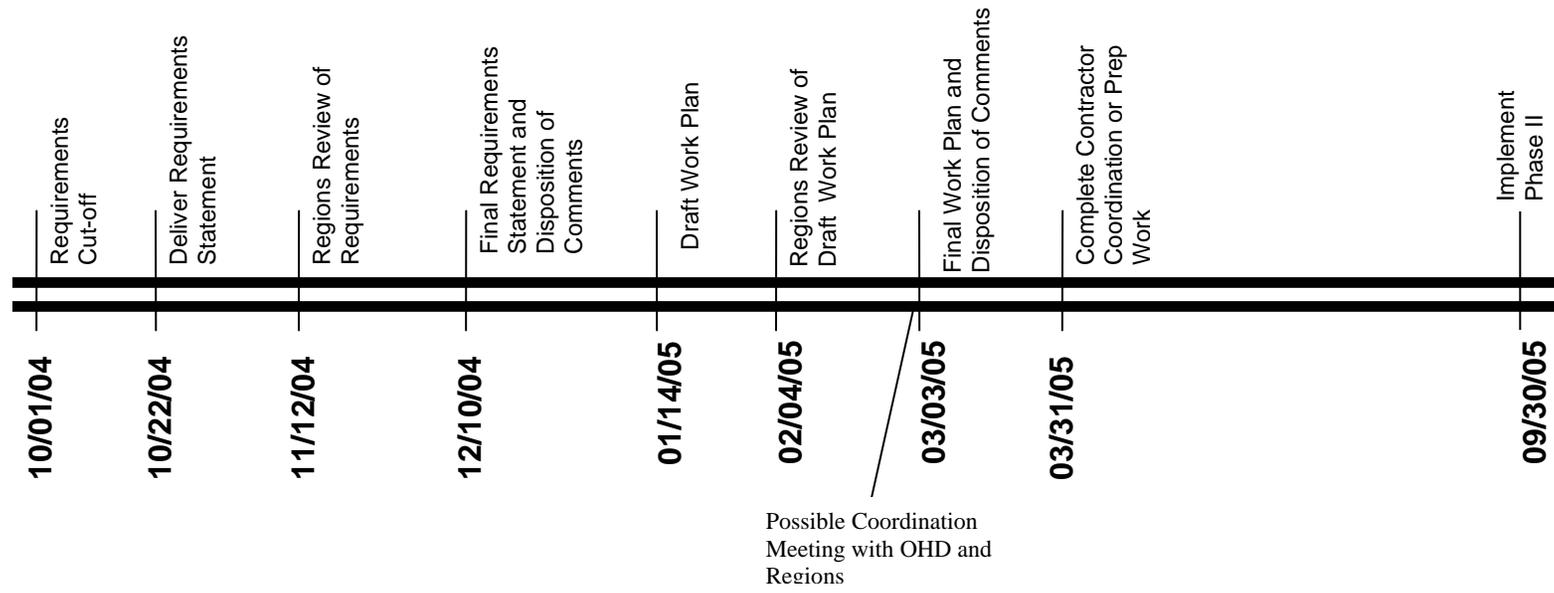


**Figure 3.** *Time line for Phase I.*

## **VII. Phase II**

Phase II will start with user input and requirements available as of October 1, 2004. It will be based on user feedback received over the last year, or so, (longer for CR) as well as whatever internal requirements can be garnered in the next few weeks.

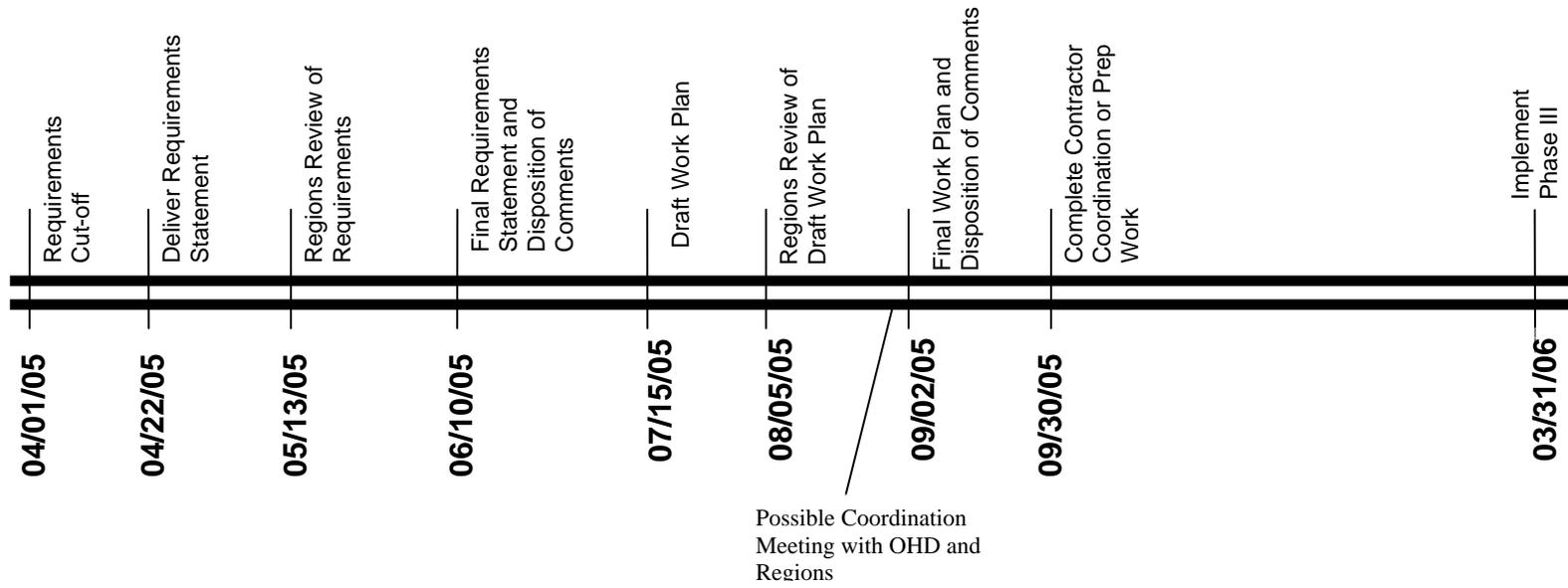
The Phase II schedule is shown in Figure 4. The sequence is identical to that described in Section IV.



**Figure 4.** *Time line for Phase II .*

## **VIII. Subsequent Phases**

Phases III and beyond will follow the schedule described in Section IV. The schedule for Phase III is shown in Figure 5.



**Figure 5.** *Time line for Phase III.*

## Appendix A: Framework to Provide a Consistent NWS Hydrology Web Presence

**Vision:** Provide a nationally consistent, easy to navigate and readily understood source of NWS hydrologic information on the Internet that is supported nationally.

**Mission:**

**A. Requirements:** Specify a requirements-driven phased implementation based, in part, on the AHPS Products and Information Team (APIT) report, "A Core Suite of Graphical Hydrologic Products and Information." OCWWS/HSD will be responsible for gathering requirements (see Appendix A) from users and the NWS Hydrologic Services Program (HSP). Using these requirements and the APIT report, OCWWS/HSD will develop a statement of requirements for each implementation phase. The statement of requirements for each phase will be provided to the Regions and OHD for comment<sup>1</sup>. While requirements will focus on new features, they will also include modification of existing Web pages to accommodate user feedback.

**B. Implementation:** Based on the requirements statement for each phase, OCWWS/HSD will negotiate an implementation plan, including explicit milestones with OHD. Requirements may need to be adjusted as part of the negotiation process. OHD will be responsible for the management of all implementation activities.

OCWWS/HSD will provide Regions with the final implementation plan. OHD will provide quarterly status reports on implementation activities. If implementation problems occur, as necessary, OCWWS/HSD will work with OHD to modify requirements and update the implementation plan, and will notify the Regions of significant changes.

Regions will provide OHD with points of contact who will be responsible for coordinating implementation activities. OHD will regularly coordinate with the Regional focal points on implementation issues.

Contributions to development of the national HSP Web pages and supporting infrastructure by staff at WFOs, RFCs and Regions will be encouraged. Regional management will be responsible for setting guidelines for participation by their staff. All support provided by field staff will be under the guidance of OHD who will assure Regional activities contribute to and are consistent with implementation plans. OHD will be responsible for coordinating contributions of NWS staff with contract support staff. AHPS resources will be used to support implementation of HSP Web pages, including travel and awards for personnel involved in implementation activities.

OHD will work closely with the Regions on implementation, in particular with the Regional web teams, as well as with the OCIO and others, to assure viability of technical solutions. OHD will also work with OCIO to assure Web pages are consistent with NWS, NOAA and DOC requirements.

OCWWS/HSD will ensure implementation of new features/Web pages comply with NWS Instruction 10-102, "New or Enhanced Products and Services."

**C. Maintenance and Support:** National HSP Web pages will be deployed to and will be run at NWS Web Farms. OHD/HL will be responsible for maintenance and support of the code it provides. Support of Web systems and communications will be the responsibility of Regions and the OCIO. As necessary, OHD/HL will assist Regional Web masters and the OCIO in diagnosing and resolving problems.

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<sup>1</sup> Coordination of the requirements statements for each phase will be similar to the process used in developing NWS Directives and Instructions. OCWWS/HSD will review comments/suggestions from Regions and OHD on the draft and will provide an explanation of how each was considered in the process of finalizing the requirements statement.

## **Appendix: Collection of Requirements**

The primary goal of collection of requirements is that the process be open and transparent.

Feedback from users about national HSP Web pages will be centrally collected using an OMB-approved survey/feedback Web page supported by the OCIO. All feedback links on AHPS Web pages will point to this page. The information provided will be posted to a data base. NWS customers and partners as well as NWS staff will be able to use an Web interface to access and review information in the data base.

Collection of suggestions and requirements from NWS staff will also use a Web-based paradigm, similar to the general feedback model indicated above. However, since input will be provided only by government employees, the Privacy Act limitations on the information collected does not apply. Therefore, the internal requirements Web page will contain more specific questions as well as opportunity for free-form input. This information will be posted to a data base that will be separate from the data base containing public input/feedback. The OCIO will also support the internal feedback/requirements page and associated data base.

Access to the internal feedback page as well as to the data base containing the input will be restricted by requiring the use of a NOAA e-mail ID and password.

## Appendix B: Feedback Survey

An example of the generic, OMB-approved survey is shown below. For AHPS, the only change will be the Name of Product/Service – it will be listed as “Advanced Hydrologic Prediction Service.”

[Home](#) -> Customer Survey

### NWS Customer Survey for Official and Experimental Products/Services

OMB Control Number 0648-0342 Expires 07-31-2004

[- Privacy Policy -](#)

**Name of Product/Service:** *Internet Listings of Watches, Warnings, and Advisories by State and Territory*

1. On a scale of 0 to 10 (10 highest), rate technical quality of this product/service (e.g., forecast accuracy, timeliness, problems with display).

Select Rating

2. On a scale of 0 to 10 (10 highest), rate how easy you found the product/service to interpret and use.

Select Rating

Please provide any suggestions for improving the usability of this product.

3. What features did you like or find useful?

**6. Tell us how you plan to use the information provided in this product/service (e.g., information only, to support personal decision-making, to support business decision making, etc)?**

**7. Comments on the Product/Service Description Document (documentation) provided.**

**8. Any additional comments/suggestions concerning this product/service.**

**9. What is your affiliation?**

**If other, explain:**

Submit

*Thank You*

Reset

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## Appendix C: Requirements Gathering Form

The key to defining requirements will be input from NWS field office staff. They are uniquely positioned to establish a dialog with their users and translate expressed needs into requirements that are consistent with NWS operations. The following form will be used to gather and systematically document requirements from within the NWS.

It is designed to gather information that will allow input to be categorized and will provide information to allow follow-up if there are questions or need for clarification.

### Hydrologic Requirements Form

Name \_\_\_\_\_

Office \_\_\_\_\_

Phone \_\_\_\_\_

E-mail \_\_\_\_\_

Category (select the one most appropriate)

- Hydrograph
- Status map - national
- Status maps - regional/local
- Precipitation
- Water Resources
- Information about service locations
- Flood Impacts
- Inundation mapping
- Skill information/verification
- Other (please specify)

Requirement Source (select all that apply)

- WFO
- RFC
- Region
- NWSHQ
- Emergency manager
- Water supply/hydropower
- "Traditional" media (radio, TV, print)
- Agriculture
- Shipping (e.g., barge)
- Natural resource management
- Consulting/add value/provide custom hydrologic services
- Recreation
- Personal use
- Other (please specify)

Scope/Impact (select one)

- National
- Regional
- State
- Local

Statement of requirement: